

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

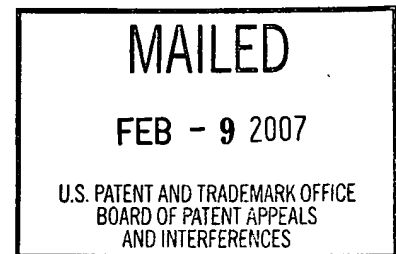
UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte KAZUHISA SAKAMOTO

Appeal No. 2007-0152
Application No. 09/208,105

ON BRIEF



Before JAMES D. THOMAS, KENNETH W. HAIRSTON, and JOSEPH L. DIXON,
Administrative Patent Judges.

HAIRSTON, *Administrative Patent Judge.*

STATEMENT OF THE CASE

Claims 9 through 14 in the subject application were finally rejected by the examiner for obviousness under 35 U.S.C.

§ 103(a). The appellant contends that the claims were improperly rejected, and has filed this appeal under 35 U.S.C. § 134.

ISSUE

Would it have been obvious to one of ordinary skill in the art to modify U.S. Patent Number 5,808,352 issued to Sakamoto on September 15, 1998 so that the individual metal electrodes on the surface of the semiconductor apparatus would be formed to cover the entire substrate?

SUMMARY OF DECISION

The evidence of obviousness produced by the examiner does not support a modification of the Sakamoto apparatus that would extend the discrete metal electrodes over the entire surface of the substrate.

FINDINGS OF FACT

As evidenced by claim 9¹, appellant has invented a semiconductor device that has a substrate that includes regions irradiated with radiating rays. The radiating rays create crystal defects within the irradiated regions of the substrate. The semiconductor device also includes impurity regions formed in the substrate. A light metal wiring layer is located over the entire substrate with the exception of openings above the irradiated regions of the substrate. The metal wiring layer is connected to each of the impurity regions. The radiating rays pass through the openings in the metal wiring layer, and generate the crystal defects within the substrate. A smaller amount of radiating rays is irradiated elsewhere in the substrate as compared to the regions under the openings because of the metal wiring layer over the substrate.

¹ See claim 9 in the Appendix.

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The examiner has rejected claims 9 through 12 as being obvious based upon the teachings of Sakamoto. Claims 13 and 14 have been rejected by the examiner for obviousness based upon the teachings of Sakamoto and U.S. Patent Number 5,981,981 issued to Takahashi on November 9, 1999.

The examiner has made findings that Sakamoto teaches a substrate 10, 11 with regions irradiated with rays to create crystal defects 21 within the irradiated regions, impurity regions 12, 13 in the substrate, and a light metal wiring layer 18, 19 comprising:

aluminum located over the substrate except at openings above the regions irradiated and being connected to each of the impurity regions, wherein radiating rays passing to the regions irradiated through the openings generate the crystal defects under the openings so that a smaller amount of radiating rays are irradiated elsewhere in the substrate as compared with said regions [answer, pages 3 and 4].

The examiner acknowledges (answer, page 4) "Sakamoto does not state that the metal wiring layer is located over the entire substrate." The examiner contends (answer, page 4) that it would have been obvious to one of ordinary skill in the art "to form the metal wiring layer over the entire substrate, in Sakamoto's device in order to simplify the processing steps of making the device." According to the examiner, "[t]he processing steps of making the device would be simplified by depositing the metal

wiring layer over the entire substrate and etching the required openings, instead of complicating the processing steps by providing special masks in order to form the metal wiring layer over selected sections of the substrate" (answer, page 4).

The appellant contends that it would not have been obvious to the skilled artisan to extend the metal electrodes 18 and 19 over the entire substrate because the surface of the substrate is covered by both the discrete metal electrodes 18 and 19 and a silicon nitride film 17 (brief, page 9). The Appellant further contends that the skilled artisan would not make the suggested modification to Sakamoto because the silicon nitride film is used as a mask during the processing of the semiconductor apparatus (brief, page 9).

PRINCIPLES OF LAW

The factual question of motivation to modify the teachings of a reference is resolved based on evidence of record, and not on the subjective belief and unknown authority expressed by the examiner. *In re Lee*, 277 F.3d 1338, 1343-44, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). An obviousness rejection under 35 U.S.C. § 103(a) can not be based on the use of impermissible hindsight knowledge. *W.L. Gore and Assocs. Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983).

ANALYSIS

The examiner's reasoning (answer, page 4) that:

[t]he processing steps of making the device would be simplified by depositing the metal wiring layer over the entire substrate and etching the required openings, instead of complicating the processing steps by providing special masks in order to form the metal wiring layer only over selected sections of the substrate

is not supported by any evidence of record. More importantly, the examiner has failed to satisfactorily explain in the record how and why the skilled artisan would replace the critical silicon nitride film 17 in Sakamoto with a metal layer. The critical question of device operability after the suggested modifications (e.g., the metal layer being connected to each of the base and emitter impurity regions 12 and 13) is left unanswered by the examiner. Thus, the only possible suggestion for modifying Sakamoto is the hindsight knowledge gleaned from appellant's disclosure.

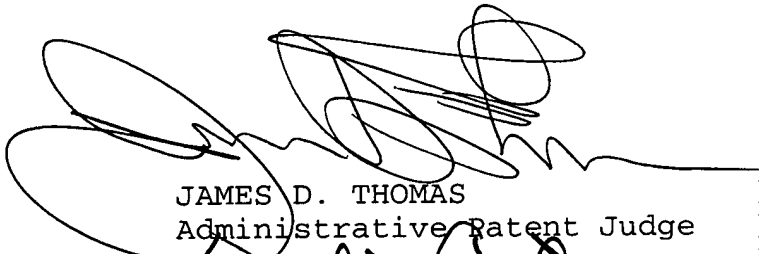
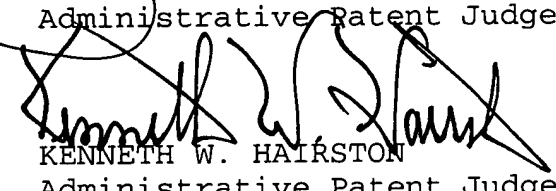
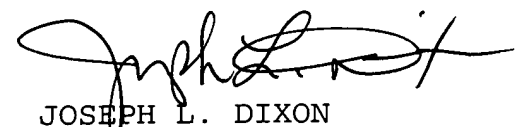
CONCLUSIONS OF LAW

The examiner has not established a *prima facie* case of obviousness because impermissible hindsight was used to modify the teachings of Sakamoto to locate a metal layer over the entire substrate.

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ORDER

The 35 U.S.C. § 103(a) rejection of claims 9 through 14 is reversed.

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JAMES D. THOMAS)	
Administrative Patent Judge)	
)	
KENNETH W. HAIRSTON)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
JOSEPH L. DIXON)	
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